

The Main Parts of a Cell

What Are the Main Parts of a Cell?

Most cells have several factors in common. In this lesson, you will learn to be able to identify the three main parts found in most cells and describe their functions. The three main parts of most cells and their descriptions are shown below. Most cells include a nucleus, the cytoplasm, and the cell membrane.

Nucleus

Long strands of chromosomes that contain **deoxyribonucleic acid (DNA)** are located in the **nucleus**. DNA is the hereditary material or the genetic blueprint for the organism. This is important for the reproduction of new cells. The nucleus is usually found near the cell's center and can be round or egg-shaped. It is usually darker in color than the rest of the cell. It is the control center of the cell. It controls all of the life processes that go on inside the cell. It is often referred to as the "brains" of the outfit.

Cytoplasm

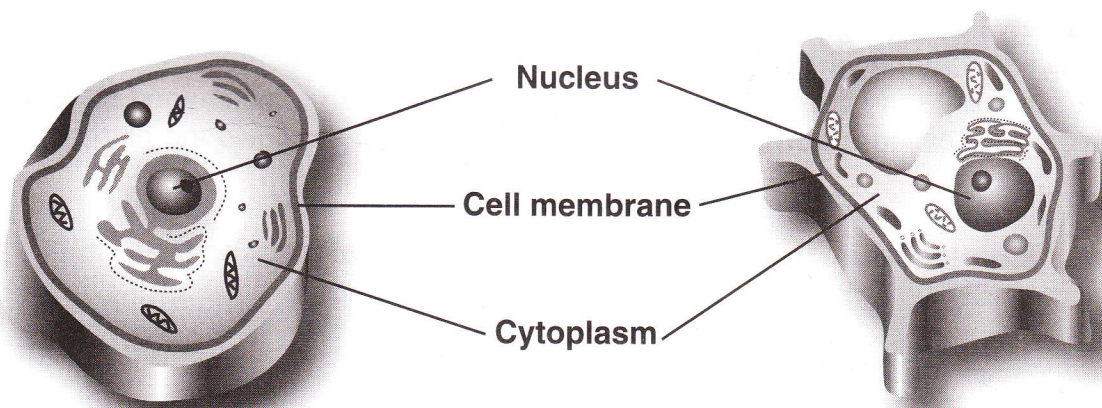
Most of the cell is made up of **cytoplasm**. It contains all the living material in a cell except for the nucleus. This gel-like area of the cell contains the chemicals needed by the cell. It resembles the white part of a raw egg. This is where most of the activities take place, as it contains all of the other cell parts, or **organelles**.

Cell Membrane

The **cell membrane** is a thin layer that encloses the cell and controls the movement of materials into and out of the cell; it offers protection and shapes the cell. It surrounds and holds the cell together. It is often referred to as the "gatekeeper" for the cell. The cell membrane seems to know which materials to let into the cell and which materials to let out of the cell.

ANIMAL CELL

PLANT CELL



What Are Other Cell Parts?

Organelles

You can compare the cell to a school. There are many components of the school that help it run. Each component has a special job to do, and they must all work together to run the school. The components of the cell are called **organelles** (or guh NELLS). Organelles are small structures that float in the gel-like cytoplasm. Each organelle must perform its unique job to keep the cell working properly. The cell is a unique miniaturization of life's functions. It moves, reacts, protects itself, grows, and reproduces more cells like itself. It has a control center, power plants, internal communication, and construction and manufacturing elements. Now that you know the three main parts of a cell, let's take a closer look at the amazing components called organelles that are responsible for keeping the cell alive.

Business in a Small World

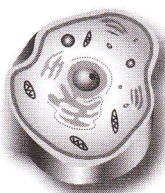
Keeping the cell in operation is the work of many different organelles. Of course, you've already learned that the nucleus is the part of the cell that keeps everything in control. Cells need power (energy) to keep things humming along. Where does the energy come from that keeps a runner going at full-blast? It comes from a tiny, sausage-shaped pod with the Greek name **mitochondrion** (MYT uh KAHN dree un). Its job is to produce the power or energy needed by burning food obtained or produced in the cell. The mitochondrion is the seat of power—the powerhouse of the cell.

The cell needs to be able to deliver the goods produced just like a manufacturing plant needs to deliver goods to its customers. The **endoplasmic reticulum** (EN doh PLAS mik ri TIK yoo lum), or ER, is a tube-like network that enables the cell to transport (deliver) material where it is needed. ER is the transfer-and-delivery setup. The prime building material for the cell is **protein**. All living things need protein for growth. Inside every cell are small round structures that make the protein, called **ribosomes**. Sometimes they operate in isolation, but usually they are found along the edge or linked to the ER. The protein is then wrapped or packaged for shipment in a complex called the **Golgi** (GOL jee) **body**. Golgi bodies, stacks of protein-filled sacs, store and package the protein the cell exports. As needed, bits of the Golgi complex breaks off, and the protein, neatly packaged, goes to market.

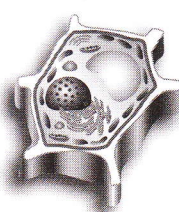
The **vacuoles** (VAK yoo wohls), another cell organelle, are liquid-filled spaces inside the cell that serve as storage bins. They store water, food, and waste for the cell. Inside plant cells, you will find that the vacuole is very large. Animal cells have numerous small vacuoles.

Other organelles in the cytoplasm of plant cells are green, disc-shaped structures that contain chlorophyll called **chloroplasts**. It is the chloroplast that allows the plant to make its own food.

A typical animal cell



A typical plant cell



Name: _____ Date: _____



The Parts of a Cell: Reinforcement Activity

To the student observer: Explain what organelles are.

Analyze: Which cells would contain more mitochondria: skin cells or muscle cells? Why?

Directions: Answer the following questions.

1. Why does a cell need energy? _____

2. List the three main parts of the cell and describe the function of each.

a. _____

b. _____

c. _____

3. Which structure in a cell makes protein? _____

4. Which structure is responsible for the transportation and delivery of materials?

5. What is stored in cell vacuoles? _____

6. What are three ways in which plant cells differ from animal cells?

a. _____

b. _____

c. _____

Name: _____ Date: _____

The Parts of a Cell: *Reinforcement Activity*

7. A cell is mostly made up of what substance? _____
8. Based on what you know about the cell membrane, what do you think the job of a nuclear membrane would be?
- _____
- _____
9. Modeling: Draw a typical animal cell in the box below and label the parts using the following terms: cell membrane, nucleus, cytoplasm, ER, ribosomes, vacuoles, mitochondria, and Golgi bodies.

